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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/932,427	09/17/1997	YOSHIO KITAMURA	1081.1055/JD	5306

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EXAMINER

PORTEKA, GARY J

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 08/932,427	Applicant(s) Kitamura
Examiner Gary J. Portka	Art Unit 2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on November 29, 2002; February 4, 2003

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1, 3, 7, 13-15, 17, and 18 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1, 3, 7, 13-15, 17, and 18 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

4) Interview Summary (PTO-413) Paper No(s). _____

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s). 31

6) Other: _____

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DETAILED ACTION

1. Claims 1, 7, 13, and 15 have been amended, claims 5, 9, 11, and 16 have been canceled, and claims 17 and 18 have been added by Applicant. Claims 1, 3, 7, 13-15, 17, and 18 are pending.

Claim Objections

2. The disclosure is objected to because of the following informalities:

a. Claim 17 is objected to at line 3, also claim 18 at lines 2-3, it is assumed herein the claims should recite “statuses [and] of said plurality . . .”. Claim 17 is also objected to at line 9, change “bys aid” to “by said”.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 7, 13-15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al., U.S. Patent 5,542,064 (hereinafter “Tanaka”), in view of Joho, U.S. Patent 5,408,634.

5. As to claims 1, 7, and 13-15 Tanaka discloses a *RAID apparatus and control method comprising*:

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- a. *Plurality of disk units (Drives 16-x) storing a plurality of copies of each of data of logical volumes ("identical data"), and disk controller (2) for accessing the disk units at the logical volumes (see Abstract, Figures 1-3, column 2 lines 14-17 and 54-67);*
- b. *The disk controller including a memory storing number of request operations to each disk, and control means comparing these and selecting the single disk having the least, and thus outputs a request to the single minimum waiting disk unit based upon the comparison (see Figure 5, column 6 line 62 to column 7 line 17, and column 8 lines 1-47), where the number is incremented/decremented for each new request/completion (see column 10 lines 19-24 and 44-49);*
- c. *Wherein the disk units perform operations in a queued order (see column 4 lines 42-49, column 7 lines 33-53, and column 8 lines 1-5);*
- d. *Wherein the memory stores the recited table indicating correspondence between disks and logical volumes (see Figure 3, and column 4 line 60 to column 5 line 27; each address designates a logical volume since for example as shown in Figure 3 logical address 2 designates a physical address at A1 that contains a plurality D1 of bytes on disk drive 1 (equals logical volume copy on one disk), or alternatively designates the physical addresses A1, A2, and A3 on three disks (equals the logical volume that spans the disks)) and selection of the disk on which a logical volume is allocated by comparison of operation numbers (of Figure 5). Status of each disk is also stored in a table, and used to avoid selecting an abnormal disk to the extent recited (see Figure 9 at 820, 825, and 830; Figure 11 at 910 and 915; also column 7 lines 4-9).*

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Tanaka does not disclose sending of the request to only the single minimum waiting disk unit. The design philosophy of Tanaka is to allow a selection of the lowest waiting disk units, since in general it is assumed therein that there are more than one equally minimum least waiting disk units (i.e., more than one disk unit with zero pending operations). However, an artisan would have recognized that if there is a single minimum waiting unit, that this unit should be the one selected, and thus advantageously be the only one sent a request. This concept is taught in an analogous multiple disk system in Joho. As described in the Abstract therein, a new access is queued only in the disk unit having the minimum waiting time. This is well understood in the art to avoid unnecessary bus and queue utilization, thus providing for maximum resource performance. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to send the request to only the single minimum waiting disk unit, because this would avoid unnecessary bus and queue use, and was known in the art previously.

6. As to claim 3, Tanaka discloses *channel adapter* (4-x and 5) as claimed (see Figure 1, and column 3 lines 58 to column 4 line 1), *device adapter* (14 and 17-x) *for accessing the disk units* (see Figure 1 and column 4 lines 19-21), and *resource manager circuit* as claimed (including MP 11-x, see column 4 lines 13-24).

7. As to claims 17 and 18, Tanaka describes setting a failure flag as indicated and cited hereinabove. This flag may be considered part of either or both of the recited tables to the extent recited. All further limitation are disclosed in the implementation of a failed disk flag as described above.

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Response to Arguments

8. Applicant's arguments filed November 29, 2002 have been fully considered but they are not persuasive. Applicants argue that neither Tanaka nor Joho teach selecting a single disk based upon minimum number of operations waiting. Examiner responds that this would have been clearly derived in their combination. Tanaka uses the number of operations to select disks, but selects a plurality of disks with the lowest number of operations. Joho teaches selecting a single disk of a plurality. As applied to Tanaka, this teaching equates to selecting the single disk with the minimum number of operations waiting.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

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10. Any inquiry concerning this communication from the examiner should be directed to Gary J. Portka at telephone number (703) 305-4033. The examiner can normally be reached on weekdays from 9:00 A.M. to 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Do Yoo, can be reached at (703) 308-4908.

Any response to this final action should be mailed to (or faxed as provided below):

Box AF
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Fourth Floor (Receptionist).

The fax phone number for the organization where this application or proceeding is assigned are as follows:

(703) 746-7238 (After Final communications)

(703) 746-7239 (Official communications)

(703) 746-7240 (Status inquiries, draft communications)

Any inquiry of a general nature relating to this application or proceeding should be directed to the Group receptionist, whose telephone number is (703) 305-3900.

Gary J. Portka
Primary Examiner
February 19, 2003

